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Anesthesia Guide for Medical Students

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Introduction

As medical students, understanding the basic principles of anesthesia, the tools involved, and the medications used is essential for safe patient care. This guide will cover essential topics including setup, preoperative considerations, airway management, anesthesia classification systems, basic anesthesia medications, types of anesthesia, and monitors used during anesthesia.

Setup: MSMAIDS

Before anesthesia is administered, it's important to ensure that the proper setup is in place. The MSMAIDS acronym is a helpful mnemonic for remembering the essential items for a safe anesthesia setup:

- M - Monitors: EKG, SpO_2, BP, Temperature, $ETCO_2$
- S - Suction: Ensure suction and Yankauer is working and ready.
- M - Medications: Necessary drugs (e.g., induction agents, muscle relaxants, analgesics, emergency meds) are available.
- A - Airway: Check equipment (e.g., masks, endotracheal tubes, laryngoscope, oral airways).
- I - Intravenous (IV) access: Ensure functional IV access.

Preoperative Considerations

Before administering anesthesia, several preoperative factors should be considered:

- **Patient History**: Assess for any medical conditions, allergies, and previous anesthetic experiences.
- **Airway Assessment**: Check for factors that might affect airway management (e.g., obesity, facial anomalies).
- **Fasting Guidelines**: Ensure the patient follows NPO guidelines based on the procedure type.
- ASA Classification: Use the **ASA (American Society of Anesthesiologists) Classification System** to assess patient fitness for anesthesia:
  - ASA I: Healthy, no systemic disease.
  - ASA II: Mild systemic disease (e.g., controlled hypertension).
  - ASA III: Severe systemic disease (e.g., chronic heart failure).
  - ASA IV: Severe, life-threatening disease.
  - ASA V: Moribund, not expected to survive without surgery.
  - ASA VI: Brain-dead patient, organ donation.

Pre-Induction

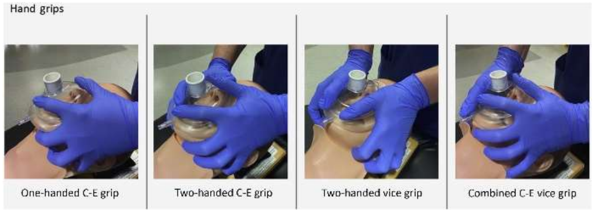
Patient verification is to be performed on entry to OR to ensure that the correct patient is going for the correct procedure, site and laterality. Consent is verified.

Fall precautions while transferring patient is essential to safety in the OR. Patients are assisted during transfer with staff members on both sides of the beds. Safety belt is to be placed before stepping away from patient

Airway Mask Ventilation (Basic Technique)

Basic mask ventilation is a critical skill for airway management, particularly in patients with difficult airways or during emergency situations.

1. **Positioning**: Place the patient in the **sniffing position** (head tilted back and chin lifted).
2. **Mask Fit**: Select the appropriate size mask. Apply it securely over the patient's nose and mouth, ensuring a tight seal.
3. **Two-Handed Technique**: Use both hands to hold the mask. One hand applies downward pressure on the mask, and the other lifts the chin to prevent airway obstruction.
4. **Ventilation**: Deliver breaths while watching for chest rise. Adjust the mask to ensure effective ventilation.

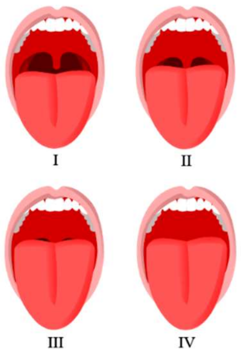


Mallampati Scoring System

The Mallampati Scoring System is a clinical tool used to assess the ease of intubation based on the visibility of the oropharynx.

- Class I: Full visibility of the uvula and soft palate. (Easiest intubation)
- Class II: Partial visibility of the uvula.
- Class III: Only the base of the uvula is visible.
- Class IV: No visibility of the uvula. (Difficult intubation)

This system is used to anticipate challenges in airway management and determine the need for specialized techniques.



Basic Anesthesia Medications

Understanding the **basic medications** used in anesthesia is crucial. Here is a summary of common medications, their dosages, and their uses.

Pre-Induction Agents

- **Midazolam**:
    - **Dosage**: 1-2 mg (IV)
    - **Use**: Sedation, anxiolysis
- **Fentanyl**:
    - **Dosage**: 1-3 mcg/kg (IV)
    - **Use**: Analgesia

Induction Agents

- **Propofol**:
    - **Dosage**: 2-2.5 mg/kg (IV)
    - **Use**: Induction, sedation
    - **Type**: General
- **Etomidate**:
    - **Dosage**: 0.2-0.3 mg/kg (IV)
    - **Use**: Induction (especially in hemodynamically unstable patients)
    - **Type**: General

Muscle Relaxants

- **Rocuronium**:
    - **Dosage**: 0.6-1.2 mg/kg (IV)
    - **Use**: Neuromuscular blockade
    - **Type**: General
- **Succinylcholine**:
    - **Dosage**: 1-1.5 mg/kg (IV)
    - **Use**: Rapid sequence intubation
    - **Type**: General

Vasopressors

- **Phenylephrine**:
    - **Dosage**: 50-100 mcg (IV bolus)
    - **Use**: Increase BP (direct alpha-agonist)
    - **Type**: General
- **Ephedrine**:
    - **Dosage**: 5-10 mg (IV bolus)
    - **Use**: Increase BP (indirect sympathomimetic)
    - **Type**: General

Types of Anesthesia

Monitored Anesthesia Care (MAC)

- **Description**: Involves sedation and analgesia with continuous monitoring. The patient remains conscious but relaxed.
- **Indications**: Minor procedures like colonoscopies, endoscopies, or dental surgeries.
- **Medications Used**: Propofol, Midazolam, Fentanyl.

General Anesthesia

- **Description**: A state of unconsciousness with loss of protective reflexes, muscle relaxation, and amnesia. The patient is completely unresponsive during the procedure.
- **Indications**: Major surgeries requiring deep sedation or complete anesthesia, such as abdominal surgery, orthopedic procedures, and open-heart surgery.
- **Medications Used**: Propofol, Etomidate, Succinylcholine, Rocuronium, Fentanyl.

Regional Anesthesia

- **Description**: Numbs a specific region of the body while the patient remains conscious. It is often used for surgeries involving the limbs or lower abdomen.
- **Types**:
    - **Spinal Anesthesia**: Injection of local anesthetic into the subarachnoid space, commonly used for lower body procedures like cesarean sections and hip replacements.
    - **Peripheral Nerve Blocks**: Local anesthetics are injected around specific nerves to block sensation in a targeted area, used for procedures on the arms, legs, or face.

Monitors Used During Anesthesia

Various monitors are essential for tracking the patient's physiological status during anesthesia:

- **EKG**: Detects arrhythmias, ischemia, and overall heart function.
- **SpO_2 (Oxygen Saturation)**: Normal values are 95-100%.
- **BP (Blood Pressure)**
- **Temperature**: Monitors body temperature to prevent hypothermia, which is common during surgery.
- **$ETCO_2$ (End-Tidal CO_2)**: Measures the amount of carbon dioxide in exhaled air. It provides valuable information about ventilation and circulation. Normal values are 35-45 mmHg.